

FIRST RECORD OF BOGIDIELLIDAE
(CRUSTACEA, AMPHIPODA) FROM THE PACIFIC:
BOGIDIELLA (*XYSTRIOGIDIELLA* N. SUBGEN.)
CAPRICORNEA NEW SPECIES FROM
THE GREAT BARRIER REEF

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ABSTRACT

A new species of *Bogidiella* (Amphipoda, Bogidiellidae), belonging to a new subgenus, is described as *B. (Xystriogidiella) capricornea*. It was found in coral sand at low tide in Heron Island, Capricorn group, Great Barrier Reef, and it represents the first member of the family Bogidiellidae to be found in the Pacific.

Members of the Bogidiellidae are blind and unpigmented, and are exclusively stygobiont (i.e., they are inhabitants of underground waters, such as cave waters, groundwaters of wells, springs, or interstices in coarse sediments). Noteworthy is that the Bogidiellidae are not restricted to continental groundwaters, but that quite a few taxa are known from interstitial waters of marine beaches and even from subtidal sediments as deep as about 50 m.

Nearly 70 species and subspecies, arranged in 20 genera and subgenera, have actually been described (Stock, 1981; Karaman, 1982a; b; and Coineau and Stock, in press).

The distribution patterns of the various taxa on (sub)generic level show in several cases disjunct occurrences, e.g., in the continental groundwaters of Europe and of South America. Such patterns seem to indicate that the (sub)genera must have reached a wide distribution even before the break-up of Pangaea (Stock, 1981).

Although the family is widely distributed over the tropical and temperate zones of the world, no representatives are known from the Pacific Ocean or Pacific islands. The nearest records are those of inland-water species in Sarawak (Borneo), Central Chile and Central America. It is true that Karaman on two occasions (1979, 17; 1982b, 34) refers to the presence of Bogidiellidae "on isolated numerous islands in Pacific," but on the basis of the published records I presume that this is a lapsus calami for "several islands in the West Indies."

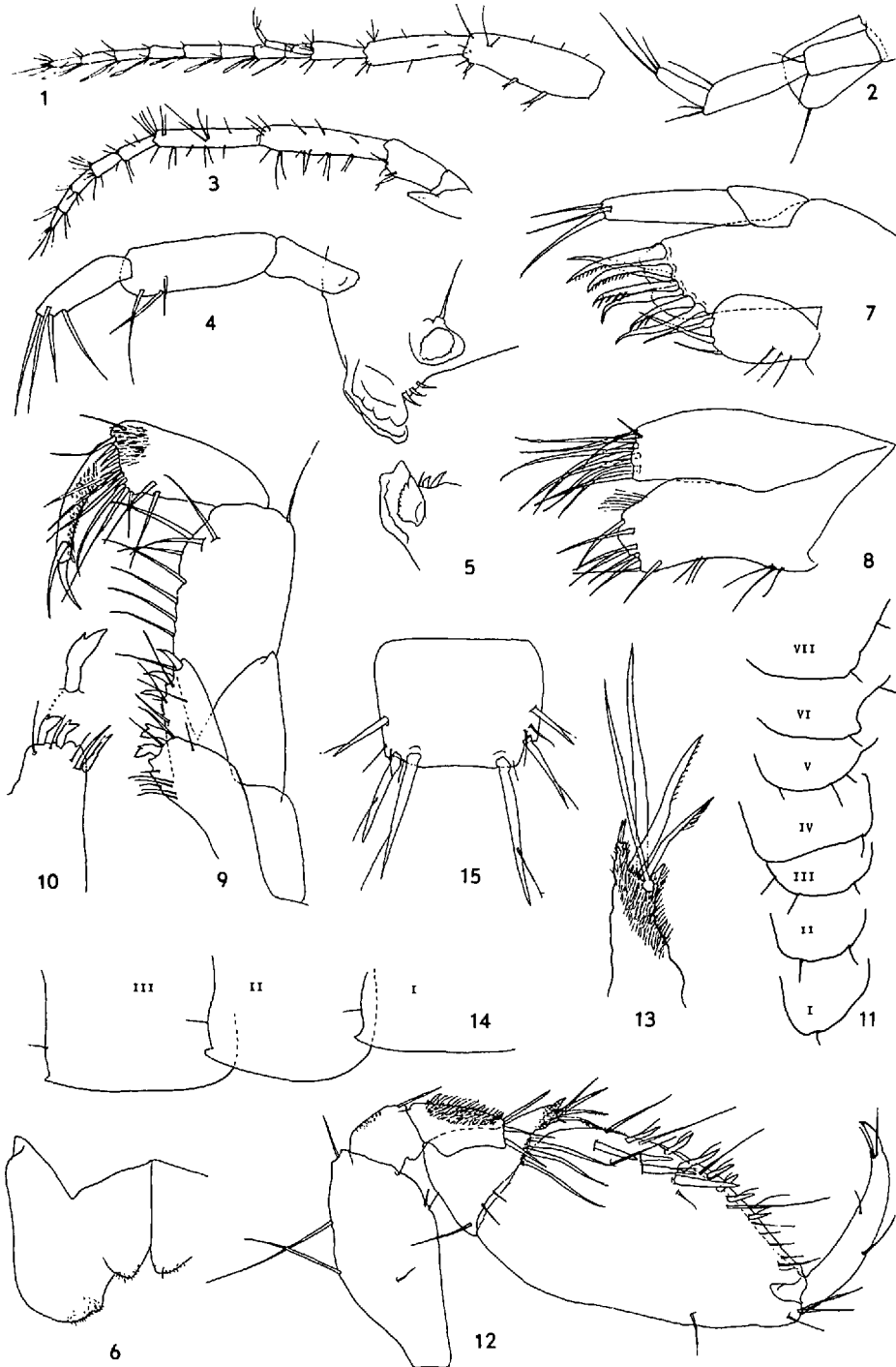
During a short visit to Heron Island (Capricorn group, Great Barrier Reef), I collected a new species, belonging to an undescribed subgenus of *Bogidiella*, from marine sands exposed at low tide; this is the first Pacific member of this interesting family of stygobionts.

Family BOGIDIELLIDAE Hertzog, 1936

Genus *Bogidiella* Hertzog, 1933

Subgenus *Xystriogidiella* new subgenus

Diagnosis.—Very similar to the subgenera *Stygogidiella* Stock, 1981, and *Antilogidiella* Stock, 1981, in that one element of the exopodite of the second male pleopod is modified, presumably for sperm transfer. Differing from *Stygogidiella* by the presence of two modified elements, one on the exopodite and one on the endopodite, of the second male uropod. Differing from *Antilogidiella* in having an unmodified first female uropod.



Figures 1–15. *Bogidiella* (*Xystriogidiella*) *capricornea* new species (♀ holotype and ♂ allotype): 1, first antenna, ♀ (scale A); 2, accessory flagellum of first antenna, ♀ (B); 3, second antenna, ♀ (A); 4, right mandible, ♀ (B); 5, pars incisiva of left mandible, ♀ (B); 6, labium, ♀ (B); 7, first maxilla, ♀ (C); 8, second maxilla, ♀ (C); 9, maxilliped, ♀ (B); 10, inner lobe of maxilliped, ♀ (B), one of the spines enlarged; 11, coxal plates I to VII, left, ♀ (D); 12, first gnathopod, ♂ (E); 13, carpal process of first gnathopod, ♂ (C); 14, epimeral plates I to III, right, ♀ (D); 15, telson, ♀ (B). Scales on next plate.

Type Species.—*Bogidiella* (*Xystriogidiella*) *capricornea* new species.

Etymology.—*Xystriogidiella* (gender feminine) is a contraction of the Greek word ξυστρον (=scraper, grater, alluding to the modified elements on the second male pleopod and uropod) and part of the generic name *Bogidiella*. The specific name *capricornea* means "from the Capricorn group."

Remarks.—The various subgenera of *Bogidiella* are characterized by the degree in which secondary sexual features are expressed. In the typical subgenus, no sexual dimorphism is present at all. In one subgenus, certain legs show strong sexual differences, in other subgenera one or more pleopods and/or one or more uropods show modifications. The new subgenus offers a combination of modifications in pleopod 2 and uropod 2, not yet recorded in the sequence of character states of the seven subgenera recognized so far.

***Bogidiella* (*Xystriogidiella*) *capricornea* new species**
(Figures 1–29)

Material.—1 ♀ (holotype), 1 ♂ (allotype) and 2 ♀♀ (paratypes). Heron Island, in rather fine coral sand exposed at low tide, just east of a small bight on the island's northern shore; 23 April 1981 (Zool. Mus. Amsterdam Amph. 107.581). Accompanying fauna: Annelida, Sipunculida, *Microcharon* (Isopoda).

Description.—As frequently the case in fragile animals such as Bogidiellidae, no specimen is complete. One or several pereopods and third uropod often lacking. Unless otherwise stated, following notes based on most intact specimen, the holotype.

Body length 1.9 mm (without antennae and uropods). Metasomites 2 through 7 and urosomites 1 and 2 each with 1 pair of small setae on dorsal surface; metasomite 1 and pleonites 1 and 2 with 2 such pairs; pleonite 3 with 3 pairs.

First antenna (Fig. 1) about half as long as body. Peduncle consists of 3 segments; first ventrally armed with 3 spines; second with about 70% of length of first; third slightly more than half as long as second. Flagellum (♀, ♂) consists of 8 segments, each (but for terminal one) provided with aesthetasc longer than corresponding flagellum segment. Accessory flagellum (Fig. 2) 3-segmented, slightly overreaching two most proximal flagellum segments.

Second antenna (Fig. 3) shorter than first, with 5-segmented peduncle and 5-segmented flagellum. Gland cone long, finger-shaped, straight. Peduncle segments 4 and 5 thin, slender, rather richly armed with long setae.

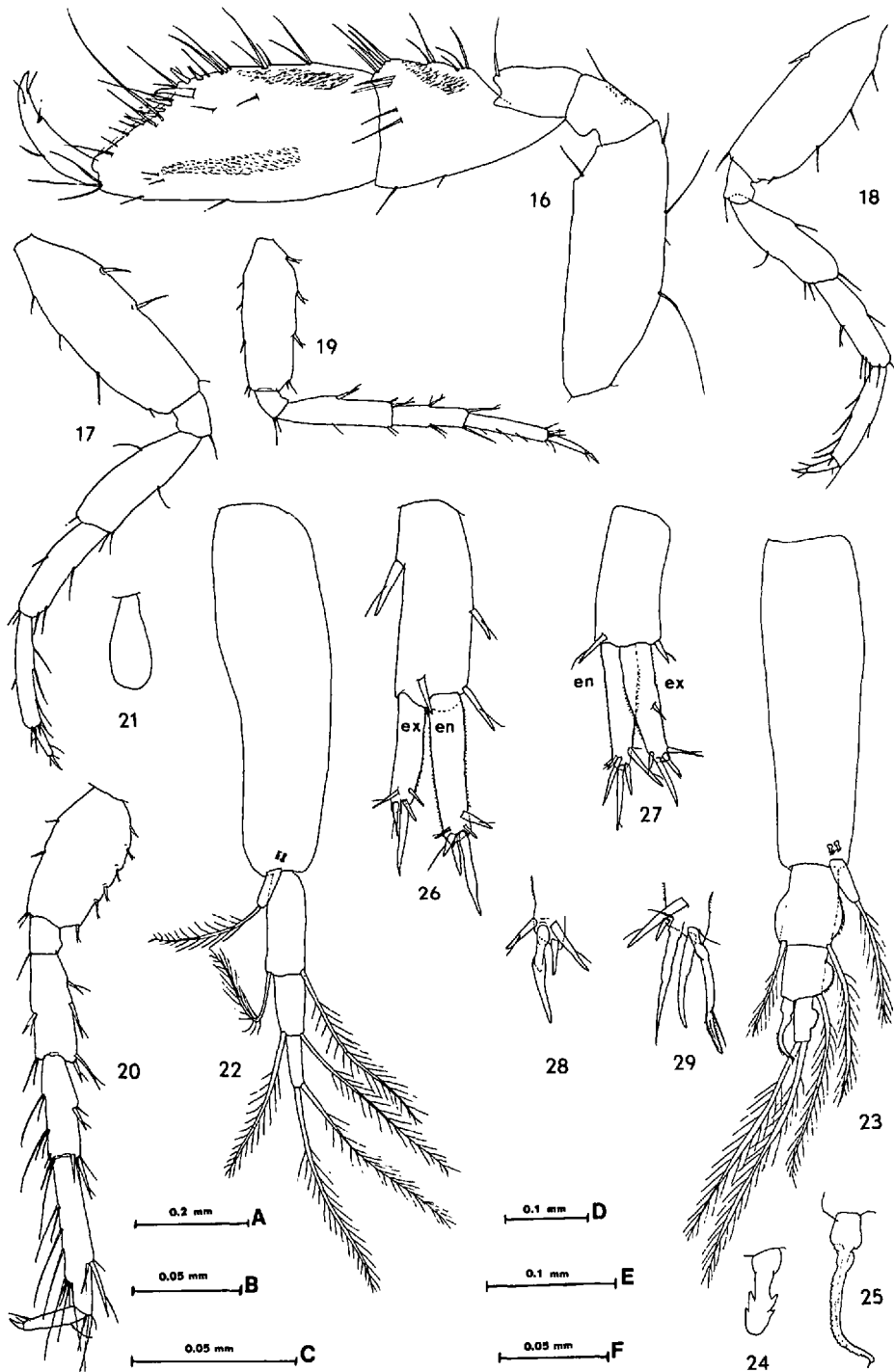
Labrum without particularities.

Mandible (Figs. 4, 5) asymmetrical in pars incisiva. This part consists of 2 blades, one of which is probably lacinia mobilis; the latter armed with 4 coarse, blunt teeth in right mandible, with numerous small teeth in left appendage. Between lacinia and pars molaris, right mandible bears 3 thin spines, left mandible 2 flat spines and setule. Pars molaris bears, both left and right, long seta. Left and right palps identical, 3-segmented; segment 1 rather elongate, unarmed; segment 2 longest and bears 3 subdistal, ventral setae; segment 3 tapering and bears 4 (sub)terminal setae.

Labium (Fig. 6) with well-developed inner lobes.

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Figures 16–29. *Bogidiella* (*Xystriogidiella*) *capricornea* new species (♀ holotype and ♂ allotype): 16, second gnathopod, ♀ (scale E); 17, third pereopod, ♀ (D); 18, fourth pereopod, ♀ (D); 19, sixth pereopod, ♀ (A); 20, seventh pereopod, ♂ (A); 21, coxal gill of sixth pereopod, ♀ (D); 22, second



pleopod, ♀ (E); 23, second pleopod, ♂ (E); 24, retinaculum of second pleopod, ♂ (freehand sketch); 25, modified element of second exopodite segment of second pleopod, ♂ (C); 26, first uropod, ♂ (F); 27, second uropod, ♀ (E); 28, tip of exopodite of second uropod, ♂ (F); 29, tip of endopodite of second uropod, ♂ (F). [en = endopodite; ex = exopodite.]

First maxilla (Fig. 7): palp 2-segmented, distal segment with 3 setae. Outer lobe distally armed with 8 strong, slightly curved, spines; outermost of these spines bear some 12 medial denticles, one of the innermost spines bears 2 medial denticles, central spine bears 4 medial denticles, and remaining spines appear to be smooth. Inner lobe ovoid, distally provided with 3 setae.

Second maxilla (Fig. 8) consists of 2 lobes; outer one bears 8 setae, placed in 2 rows; inner lobe bears 3 pairs of stiff elements plus 2 single elements.

Maxilliped (Fig. 9) of usual general type. Third palp segment rather elongate, distally armed with row of long, medial setae and row of heavy distal spines; fourth palp segment bears usual distal claw plus exceptionally strong subdistal seta. Outer lobe bears 3 rather heavy, slightly curved, distal spines. Two spines on truncate distal margin of inner lobe (Fig. 10) exceptional in their flat, wide, bicuspidate shape.

Coxal plates 1 to 7 (Fig. 11) small, hardly at all overlapping.

Gnathopod 1 (Fig. 12) not sexually dimorphous. Basis with 2 setae on posterior margin. Carpus with strongly projecting distoposterior process; this process (Fig. 13) bears distally 2 spiniform projections, 1 seta, and 3 spines. Propodus egg-shaped; posterior margin bears, in addition to 3 palmar angle spines, 2 + 1 more proximal spines; palmar margin bears 4 spines and couple of setae. Palmar index (sensu Ruffo, 1973) 0.42–0.46 (♀, ♂).

Second gnathopod (Fig. 16) with trapezoidal, non-projecting carpus. Basis with 2 posterior setae. Propodus slightly smaller than that of gnathopod 1. Three palmar angle spines. Palmar margin bears 4 smaller spines and several setae. Palmar index (♀) 0.31.

Third (Fig. 17) and fourth (Fig. 18) pereopods very similar. Fifth pereopod lacking in all specimens examined. Sixth pereopod (Fig. 19) with very long and slender terminal claw; anterior margin of propodus armed with 4 spines. Seventh pereopod (♂) (Fig. 20) heavy, lacking in all females at our disposal; propodus with 6 long setae on anterior margin. Lenticular organs, if present, invisible in preserved specimens.

Coxal gills (Fig. 21) present on somites carrying pereopods 4, 5, and 6. Oös-
tegites linear, not setose (female in non-reproductive phase).

Epimeral plates 1 to 3 (Fig. 14) with setule on their posterior margin; posterior corner ending in small point.

Pleopods 1 to 3 biramous (♀, ♂); exopodite 3-segmented; endopodite 1-segmented, reduced in size, distally ending in 1 plumose seta. Mediodistally, pedunculus bears 2 retinacula (Fig. 24) of double-anchor shape. Second pleopod (Fig. 22) sexually dimorphous: in female similar to pleopods 1 and 3; in male (Fig. 23) 3 segments of exopodite bear medial lamellar expansion, segment 1 shows also lateral lamellar expansion. Outer seta of segment 1 reduced in length, but normally plumose. Outer seta normally present on segment 2 replaced by sigmoid, denticulated spine with swollen base (Fig. 25).

First uropod (Fig. 26) not sexually dimorphous. Peduncle bears strong basofacial spine. Exopodite shorter than endopodite; both rami "normal" (i.e., not transformed in dagger-like way and with long distal spines).

Second uropod (Fig. 27) sexually dimorphous. In female both endo- and exopodite carry normally developed spines. One of the endopodite spines of male (Fig. 29) modified: somewhat S-shaped, bears strong lateral cilium (stronger than usual) and distally edges finely denticulated. One of terminal exopodite spines (Fig. 28) in male has swollen base and somewhat spear-shaped appearance.

Third uropod lacking in all specimens examined, but in analogy with situation in other members of genus, this considered of little importance since appendage hardly ever provides useful taxonomic characters.

Telson (Fig. 15) not sexually dimorphous; bears 1 long medio-lateral spine and 2 disto-lateral spines. Distal margin very slightly concave.

Remarks.—In addition to the characters used for the differentiation of a new subgenus, the present species is well-characterized, in both sexes, by the complex morphology of the posterior projection on the carpus of gnathopod 1, and by certain features in the maxilliped (shape of the distal spines on the inner lobe, presence of a row of strong spines on palp segment 3, presence of a very strong seta near the base of the terminal palp claw).

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